

PATENT
Attorney Docket No. 100191
LVM Reference No. 221464

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Schroeder et al.

Art Unit: 1763

Application No. 10/660,379

Examiner: George A. Goudreau

Filed: September 11, 2003

For: CHEMICAL-MECHANICAL
POLISHING COMPOSITION AND
METHOD FOR USING THE SAME

**DECLARATION UNDER 37 C.F.R. § 1.132 OF
DAVID J. SCHROEDER**

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I, David J. Schroeder, hereby declare that:

1. I am an employee of Cabot Microelectronics Corporation and one of the co-inventors of the subject matter disclosed and claimed in the subject patent application.
2. In order to test the effects of the addition of calcium ion to polishing compositions comprising various abrasives on the polishing of a substrate comprising tantalum, the surfaces of eight similar substrates comprising tantalum were polished with four pairs of polishing compositions, each pair comprising 6 wt.% of a particular abrasive and one of each pair further comprising added calcium ion. Each polishing composition further comprised 0.3 wt.% of acetic acid and 3 wt.% of hydrogen peroxide, and the pH was adjusted to pH 10 by the addition of potassium hydroxide. Each of the substrates was polished using similar polishing parameters.
3. The abrasives used, amount of calcium ion added, and the observed tantalum removal rate are set forth as follows:

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Abrasive	Calcium content (ppm)	Ta RR (Å/min)
Bindzil silica (precipitated)	0	881
Bindzil silica (precipitated)	40	905
SCE silica (fumed)	0	114
SCE silica (fumed)	40	900
Degussa AE90 (fumed)	0	117
Degussa AE90 (fumed)	40	828
Fumed alumina	0	388
Fumed alumina	20	403

4. The results of the polishing experiments demonstrated that addition of calcium ion to polishing compositions comprising two different fumed silicas (i.e., SCE silica and Degussa AE90 silica) resulted in tantalum removal rates that were 7.9 times and 7.1 times greater than for the corresponding compositions without added calcium. Addition of calcium ion to polishing compositions comprising a precipitated silica (i.e., Bindzil silica) or fumed alumina had a negligible effect on tantalum removal rate.

5. I hereby declare that all statements made herein of my own knowledge are true, that all statements made on information and belief are believed to be true, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date:

8/5/2005

David J. Schroeder